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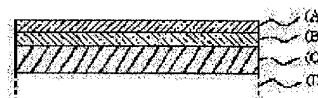
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(54) MULTI-LAYER STRUCTURE AND EASILY OPENABLE CONTAINER

(57)Abstract:

PURPOSE: To provide an easily openable container which can display the features of a base material layer while ensuring the easy peelability of an opening/ peeling layer.

CONSTITUTION: A polypropylene surface layer (A) is formed on a base layer 9c0 consisting of a resin composition containing 30-60wt.% of polypropylene, 20-50wt.% of high density polyethylene, 5-30wt.% of low density polyethylene or ethylene propylene rubber, and 0-80wt.% of a scale form inorganic filler, by a thermoplastic resin intermediate layer (B) consisting of a resin composition containing 45-95wt.% of high density polyethylene, and 5-55wt.% of low density polyethylene or ethylene propylene rubber. Then, a multi-ply structure of which the interlaminar peel strength between (A) and (B) is 0.2-1.0kg/15mm, and the interlaminar peel strength between (B) and (C) of which is 3 times or higher of the interlaminar peel strength between (A) and (B), and an easily openable container which has an opening peripheral edge part to annularly seal a lid are obtained.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention relates to the open-easiness container excellent in the sealing performance for containing and packing a packing field especially the multilayer-structure object used suitable for a manufacture of a container, the food manufactured using this, a chemical, a makeup agent, etc., and opening nature.

[0002]

[Description of the Prior Art] In packing of goods, especially food, after filling up a container with food, voile and the retort sterilization are performed. In this case, unless it makes the seal intensity of lid material high, internal pressure cannot be borne, but if this is made high, opening nature will fall at the time of use. As a means to solve this, opening at the time of use is not performed to JP,62-251363,A by the sublation of a sealing surface currently generally performed. By making into an opening surface of separation between the layers with the layer which touches the surface layer of a multilayer container, and it, using a multilayer container as a container, and preparing a slitting in the surface layer of a multilayer container inside the seal section The open-easiness container excellent in the sealing performance which was made to exfoliate lid material with the surface layer outside a slitting, and opening nature is indicated, leaving the surface layer inside a slitting without making it exfoliate from the layer which touches it.

[0003] However, controlling uniformly the peel strength of an opening stratum disjunctum, i.e., the surface layer of a multilayer container, also in this case has the trouble where it is difficult and the opening nature stabilized not necessarily is not obtained.

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention is a multilayer-structure object used suitable for a manufacture of the open-easiness container which sets aside a heat-sealing side and an opening surface of separation, and it offers the multilayer-structure object which enables it to employ the characteristic feature of a base-material layer efficiently, securing the easy-releasability of an opening stratum disjunctum.

[0005] By change of the combination of the resin of a process condition and each class etc., an interlaminar-peeling intensity is stabilized, moreover, the characteristic feature of a base-material layer is efficiently employed with the combination of a resin material, and other purposes of this invention have also collected and carried out the reuse of the scrap to offer a possible multilayer-structure object.

[0006] Other purposes of this invention are excellent in sealing performance and opening nature using the above-mentioned multilayer-structure object, and are to offer the open-easiness container whose peel strength in the case of opening was especially stable.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, as a result of inquiring zealously, by making into a lamination [****] the multilayer-structure object used for a manufacture of a container, this invention person finds out that the aforementioned technical problem is solvable, and came to complete this invention based on this knowledge.

[0008] this invention 20 - 50 % of the weight of namely, 30 - 60 % of the weight of polypropylene, high density polyethylenes, In the base-material layer (C) which consists of a resin constituent containing a low density polyethylene or 5 - 30 % of the weight of ethylene propylene rubbers, and 0 - 80 % of the weight of piece [of Lynn]-like inorganic bulking agents, a high density polyethylene 4 It comes to form a polypropylene surface layer (A) through the thermoplastics interlayer (B) who consists of a resin constituent containing 5 - 95 % of the weight and a low density polyethylene, or 5 - 55 % of the weight of ethylene propylene rubbers. (A) The multilayer-structure object whose interlaminar-peeling intensity between (B) and (C) the interlaminar-peeling intensities between (B) are 0.2-1.0kg / 15mm, and is 3 or more times of the interlaminar-peeling intensity between (A) and (B) is offered.

[0009] As quality of the material of the base-material layer of (C) of this invention, the resin constituent which made polypropylene and the high density polyethylene contain a low density polyethylene or an ethylene propylene rubber is used.

[0010] It is desirable to make the resin constituent which constitutes a base-material layer (C) contain a piece [of Lynn]-like inorganic bulking agent 20 to 70% of the weight. As a piece [of Lynn]-like inorganic bulking agent, talc and a mica are used preferably. The multilayer-structure object which has high rigidity, thermal resistance, and ***** by this is obtained.

[0011] As polypropylene, the random copolymers with alpha olefins, such as ethylene, butene-1, the pentene -1, the 3-methylbutene -1, and 4-methyl pentene -1, such mixture, etc. are mentioned other than the propylene homopolymer of high

crystallinity. The mixture which contains the gay polypropylene obtained by the multi-stage polymerization as a random copolymer is also contained. In the aforementioned copolymer, the following [10 mol %] have the desirable rate of a copolymerization monomer. Moreover, what has a melt index in the domain of 0.1-20 is suitable for these polypropylene. [0012] What has a melt index in the domain of 0.02-50, and has 0.900-0.975g/cm of densities in the domain of 3 as a high density polyethylene is used suitably.

[0013] What has a melt index in the domain of 0.2-5, and has 0.90-0.95g/cm of densities in the domain of 3 as a low density polyethylene is used suitably.

[0014] What carries out copolymerization of the two mols of the propylenes to one mol of ethylene, and is obtained in ethylene and a propylene as an ethylene propylene rubber is used suitably.

[0015] If the low density polyethylene of a base-material layer (C) and the content of an ethylene propylene rubber is less than 5 % of the weight, the interlaminar-peeling intensity of a base-material layer (C) and a thermoplastics interlayer (B) will become low, and it will stop obtaining the stable easy-releasability between a propylene surface layer (A) and the layer with a thermoplastics interlayer (B). On the other hand, if 30 % of the weight is exceeded, the container rigidity when container-izing will fall.

[0016] It is the purpose which lessens enhancement in gas barrier nature, and deformation at the time of considering as a container, and the layer (D) which consists of a material of further others may be prepared in the field of the opposite side of the field touching, the outside (B), i.e., the thermoplastics interlayer, of a base-material layer (C) of this invention. As a layer which consists of other materials, what was excellent in gas barrier nature, such as resin layers, such as an ethylene-vinyl alcohol copolymer, a polyvinylidene chloride, nylon, and a polyethylene terephthalate, an aluminum vacuum evaporation layer, aluminum foil, aluminum, iron, and copper, for example is mentioned. There is one layer (D) which consists of a material besides these, and it may be multilayer field which consists of more than two-layer, and may be a resin layer containing 10 - 80 % of the weight of inorganic bulking agents. Furthermore, you may be composite material, such as a metal and paper.

[0017] The polypropylene same as an example of the polypropylene which constitutes the polypropylene surface layer (A) of this invention as what is used for a base-material layer (C) is mentioned.

[0018] It is prepared in order that the thermoplastics interlayer (B) of this invention may adjust the peel strength of a multilayer-structure object, and the same high density polyethylene as a base-material layer (C), a low density polyethylene, and an ethylene propylene rubber are used. If the content of a low density polyethylene or an ethylene propylene rubber is less than five weights, the peel strength between (A) and (B) will become larger than 1.0kg / 15mm, and an initial opening intensity will serve as size. If 55 % of the weight is exceeded, the peel strength between (A) and (B) will be set to 0.1kg / 15mm or less, and **** by transportation, edge peeling at the time of an archive, and the internal pressure intensity at the time of a retort etc. will arise.

[0019] the multilayer-structure object of this invention -- three layers, the above (A), (B), and (C), -- having -- the interlaminar-peeling intensity between (A) and (B) -- 0.2-1.0kg / 15mm -- desirable -- 0.5-0.7kg / 15mm -- it is -- and the interlaminar-peeling intensity between (B) and (C) -- 3 or more times of the interlaminar-peeling intensity between (A) and (B) -- desirable -- 5 or more times -- it is .

[0020] In this invention, by setting up the interlaminar-peeling intensity between (A) and (B) and between (B) and (C) in this way, a surface layer (A) and an interlayer (B) are made into easy-releasability, and the interlayer (B) and the base-material layer (C) are made into the difficulty detachability. Consequently, when this multilayer-structure object is used as a container, it becomes open-easiness and the stable opening nature comes to be obtained. Moreover, in order not to affect the interlaminar-peeling intensity between (A) and (B) at all if it is used by returning a scrap to a base-material layer (C) even if it faces the reuse of a scrap, the stable easy-releasability is secured.

[0021] A control of the peel strength between each class can be easily performed by choosing suitably the modality of resin of a resin material which was mentioned above, the amount of a bulking agent, etc.

[0022] Moreover, the peel strength between (A) and (B) should be stabilized irrespective of the thermoforming conditions when processing the extrusion conditions when considering as multilayer structure, and a multilayer-structure object.

[0023] Although especially the thickness of each class is not restricted, the thickness which is the grade in which an interlaminar peeling is possible according to the modality of resin, i.e., the thickness to which material breaking strength becomes larger than peel strength, is required for the polypropylene surface layer (A), and it is usually 5-300 micrometers. Moreover, as for a thermoplastics interlayer (B) layer, it is desirable to consider as 20% or less preferably in consideration of film production nature 30% or less of overall thickness Mino of a multilayer-structure object, and it is usually 5-300 micrometers. Moreover, especially a limit does not have the thickness of a base-material layer (C), and it is usually 10-3000 micrometers.

[0024] In this invention, since the peel strength between (A) and (B) is controllable in a suitable size In collecting the scraps of the multilayer-structure object which can attain combination of feeding equipment and simplification in manufacturing the multilayer-structure object of this invention, and consists of three layers, and carrying out a reuse Even if it uses it by returning to a base-material layer (C), in order not to influence the peel strength between (A) and (B), it has the big advantage that change of the amount of recoveries is also attained.

[0025] The multilayer-structure object of this invention can be obtained using the above mentioned resin by co-extrusion sheets, the co-extrusion blow-molding container, or lamination. As lamination, technique, such as an extrusion lamination, a hot-melt lamination, a dry laminate, and a wet lamination, can be used, for example. However, the two-layer structure object

which consists of a (A) and (B) layer at least is usually obtained by co-extrusion molding.

[0026] The open-easiness container of this invention is a container which has the opening periphery section for carrying out the seal of the lid material annularly, it has the multilayer structure which consists of (A) to which the periphery section uses a sealing surface as a polypropylene surface layer, and which was described above, (B), and (C), and the line is formed in slight annular weakness inside the annular seal section of the polypropylene surface layer in the periphery section.

[0027] Drawing 1 is a fragmentary sectional view of the multilayer-structure object of this invention, and (A) is other layers, such as a layer which has the gas barrier nature which as for a polypropylene surface layer and (B) a thermoplastics interlayer and (C) embrace to a base-material layer, and (D) embraces the need, and is prepared. moreover, the layer of further others outside / of (D)] -- or you may prepare (B) and (A) layer

[0028] Drawing 2 is a cross section of one embodiment of the open-easiness container of this invention which fabricates a multilayer-structure object and was obtained. As for a polypropylene surface layer and 2, 1 is [a thermoplastics interlayer and 3] base-material layers. 1, 2, and 3 have taken the multilayer structure which consists of the above (A), (B), and (C), and they form the container opening periphery section 4. 5 is heat sealed by the top of the opening periphery section of an open-easiness container, and annular by lid material, and forms the packing field. As for the quality of the material of the lid material 5, it is desirable to consider as the same quality of the material as the surface layer 1 of an open-easiness container from the point of seal nature. It weakens inside the annular seal section 6 of a surface layer 1, and the line 7 is formed. What thing may be used, as long as it can cut a surface layer easily, although it is for cutting a surface layer 1 and it is usually prepared as an annular notch by the inside of the container opening periphery section 4, when it weakens, a line 7 opens the lid material 5 and a surface layer 1 is exfoliated, in addition when removing lid material. In addition, it weakens with a heat-sealing inner circumference edge, and, as for spacing t between lines, it is usually preferably desirable to be referred to as 1-10mm 0.5-10mm. 8 is the tongue section prepared in order that lid material might lengthen and ** might make ** easy.

[0029] Although especially the configuration of the periphery section of a container is not limited, usually, they are a circle, a rectangular head, etc. and is annularly heat sealed in the periphery section of this configuration. Moreover, even if a container configuration is a cup-like, it may be a tray-like.

[0030] In drawing 2, opening of the container which sealed the open-easiness container of this invention by lid material has the tongue section 8 up, and raises it. Then, it exfoliates and weakens between the polypropylene surface layer 1 of an open-easiness container, and the thermoplastics interlayer 2, the polypropylene surface layer 1 exfoliates till the place of a line 7, and it is removed with the lid material 5. Subsequently, it weakens, the polypropylene surface layer 1 is cut in the place of a line 7, and opening of a packing container is performed. Therefore, even if difficulty sublation heat sealing of the polypropylene surface layer 1 of the lid material 5 and an open-easiness container is carried out, it can open easily. And compared with the conventional method which exfoliates from a sealing surface, there are not a difference of the notch effect by the imperfect seal of a seal edge and seal conditions, influence of an impurity, etc., and stability of the opening force can be aimed at. Moreover, since sublation becomes possible even if it makes peel strength of heat sealing high, the thermal resistance which is equal to voile and retorting serves as a good multilayer container. Furthermore, even if the peel strength of the polypropylene surface layer 1 changes the resin material of a multilayer-structure object, and the process condition of a container, it is stable. Moreover, since a lot of piece [of Lynn]-like inorganic bulking agents can be blended with the base-material layer 3, the container excellent in rigidity, an intensity, thermal resistance, etc. is obtained.

[0031] The open-easiness container of this invention can be obtained by fabricating by the vacuum forming, the pressure forming, the press forming, etc., or fabricating by injection molding, the injection blow molding, the blow molding, etc. using the aforementioned resin using the aforementioned multilayer-structure object.

[0032] The multilayer-structure object of this invention can be used also as the packing field of the shape not only of a container but a bag, and lid material of an open-easiness container which opens using the interlaminar peeling of lid material.

[0033]

[Example] Hereafter, although this invention is explained in detail based on an example, this invention is not limited to this. The peel strength between the configuration resin of the multilayer-structure object of this invention with which one to examples 1-6 and example of comparison 3 table 1 was manufactured in the examples 1-6 and the examples 1-3 of a comparison, and the multilayer-structure object of the example of a comparison, and a layer, and the sublation fitness at the time of manufacturing a packing container using this multilayer-structure object -- being shown -- O -- sublation fitness good (opening nature is good) and ** -- the sublation fitness -- common (opening is possible somehow by opening angle change) and x are poor sublation fitness (the container opening periphery section deforms and smooth opening is impossible) In addition, the notation in Table 1 shows the following.

Random PP: A propylene random copolymer, the product made from Idemitsu Petrochemistry, Idemitsu polypropylene F-744N (MI=7, density =0.90g/cm3)

Gay PP: Gay polypropylene, the product made from Idemitsu Petrochemistry, Idemitsu polypropylene E105GM (MI=0.6, density =0.90g/cm3)

HDPE: A high density polyethylene, the product made from Idemitsu Petrochemistry, Idemitsu polyethylene 540B (MI=0.35, density =0.95g/cm3)

LDPE: A low density polyethylene, the TOSOH CORP. make, ***** 172 (MI=30, density =0.92g/cm3)

Talc: Made in Katsumitsu Crest, mean particle diameter The multilayer three sort sheet of five layers shown in drawing 3 in the resin constituent of (A), (B), and (C) using a simultaneous extrusion and feed block and a flat die by three sets, 10 micrometer multilayer-structure object extruder A (50mm of the diameters of a screw), extruder B (diameter of screw 50phi),

and extruder C (65mm of the diameters of a screw), of extruders was obtained. The peel strength in the class interface of the obtained sheet was measured. (A) Thickness of a layer, (B) layer, and (C) layer was set to 100 micrometers, 100 micrometers, and 600 micrometers, respectively.

[0034] Measurement of the peel strength between layers adopted the 180 degree exfoliating method, and the sample width at this time set 15mm and the sublation speed to 300mm/min.

A container which shows aperture 72mmphi and the round shape container of a contraction ratio 03 in drawing 2 with a vacuum forming using the multilayer-structure object obtained with the open-easiness container above was obtained. In the container, it weakened at the flange periphery section, and the notch was put in as a line. When sublation opening was performed after performing retorting for 120 degrees C and 30 minutes after heat sealing as $t=15\text{mm}$ using the polypropylene surface layer (Shilu) of a container after filling up these containers with water, and a resin film (80 micrometers) of the same kind, each container obtained using the multilayer-structure object of this invention showed the outstanding opening nature.

[0035]

[Table 1]

| | 樹脂構成 (wt %) | | | 剥離強度 (kg /15mm) | | 剥離適性 |
|-------|----------------------------|------------------------|--|-----------------|-----|------|
| | A | B | C | A/B | B/C | |
| 比較例 1 | ランダム PP | HDPE | タルク (30) ホモ PP (28) HDPE (42) LDPE (0) | 1.2 | 2.1 | × |
| 実施例 1 | ランダム PP | HDPE (80) LDPE (20) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.7 | 3.4 | ○ |
| 実施例 2 | ランダム PP | HDPE (50) LDPE (50) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.2 | 3.1 | ○ |
| 比較例 2 | ブロック PP | HDPE | タルク (30) ホモ PP (28) HDPE (42) LDPE (0) | 1.8 | 2.0 | × |
| 実施例 3 | ブロック PP | HDPE (80) LDPE (20) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.9 | 2.9 | ○ |
| 実施例 4 | ブロック PP | HDPE (50) LDPE (50) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.5 | 3.2 | ○ |
| 比較例 3 | ランダム PP (50) ホモ PP (50) | HDPE | タルク (30) ホモ PP (28) HDPE (42) LDPE (0) | 0.9 | 2.0 | × |
| 実施例 5 | ランダム PP (50) ホモ PP (50) | HDPE (80) LDPE (20) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.6 | 3.1 | ○ |
| 実施例 6 | ランダム PP (50) ホモ PP (50) | HDPE (50) LDPE (50) | タルク (30) ホモ PP (20) HDPE (30) LDPE (20) | 0.2 | 3.2 | ○ |

[0036]

[Effect of the Invention] If an interlaminar-peeling intensity can be stably controlled by change of the combination of the resin of a process condition and each class etc. and recovery mixture of the scrap is moreover carried out at a base-material layer (C), since peel strength will not be influenced by the amount of recoveries, a scrap recovery and reuse are very easy for the multilayer-structure object of this invention. Since the width of selection of a base-material material is still large, the characteristic feature of a base material can fully be employed efficiently.

[0037] Moreover, the open-easiness container obtained from this multilayer-structure object is excellent in sealing performance and opening nature, and its peel strength in the case of opening is also stable, voile and retorting are also possible, and the practical value is size.

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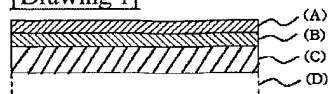
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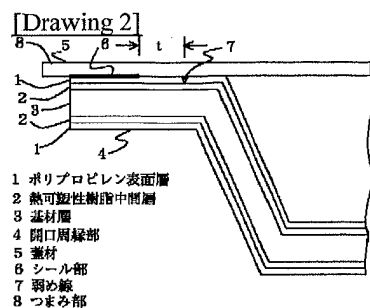
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 3]

| | |
|-----|---------------|
| (A) | (100 μ m) |
| (B) | (100 μ m) |
| (C) | (800 μ m) |
| (B) | (100 μ m) |
| (A) | (100 μ m) |

[Translation done.]